

# PTHA in California

## Pilots Studies, Map Production, and Applications



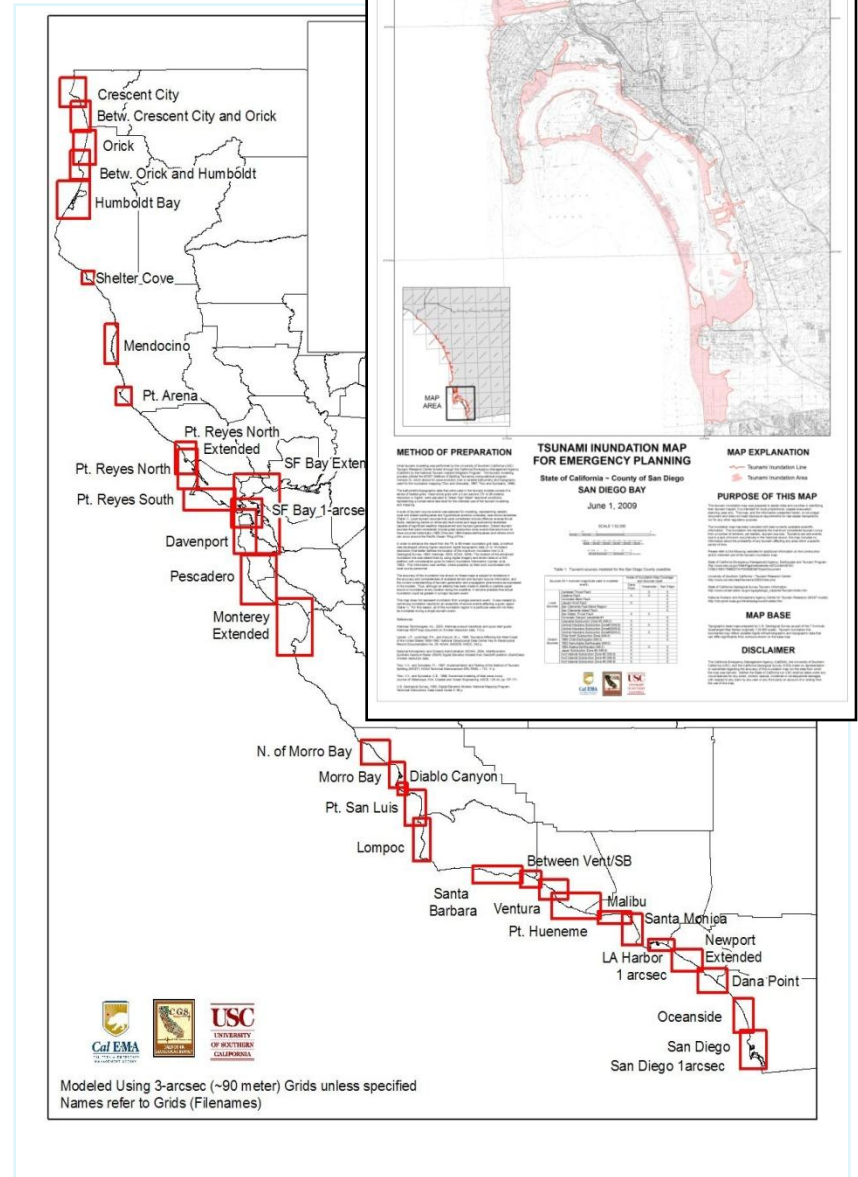
Rick Wilson, California Geological Survey



NTHMP Hazard/Risk Analysis Workshop  
July 25, 2012

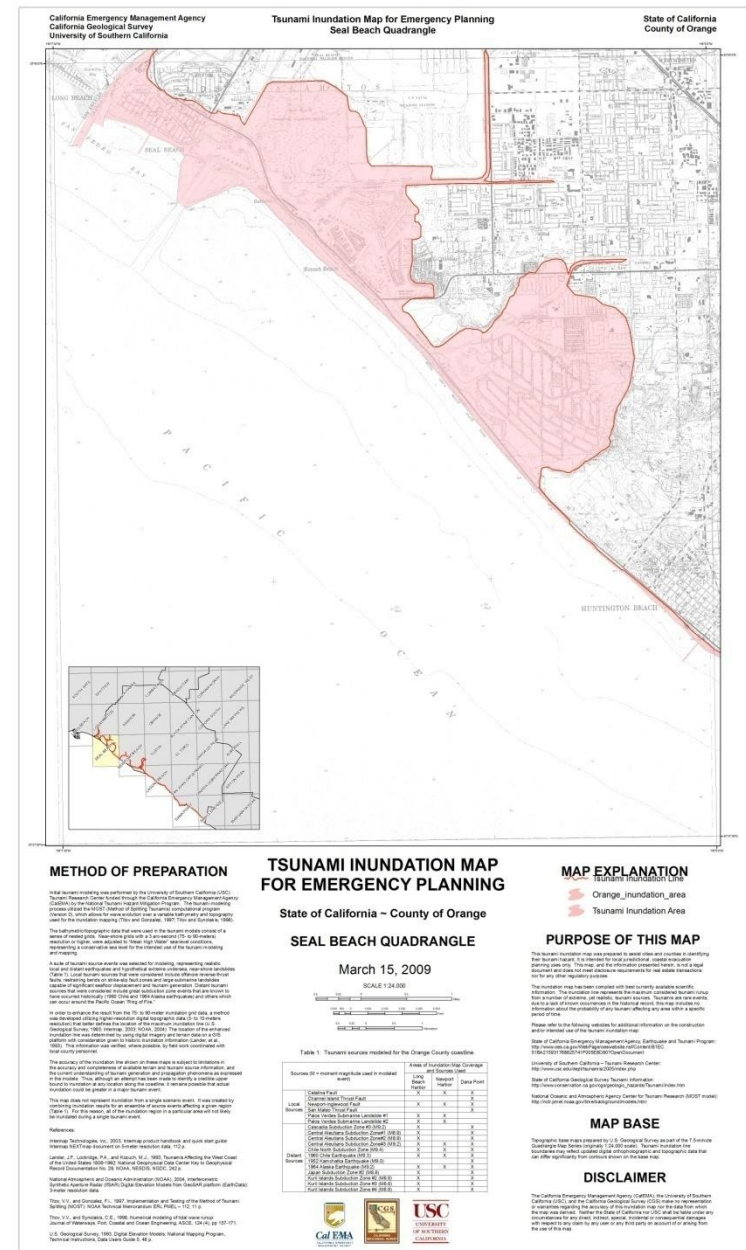
# Tsunami Hazard Preparedness Community Needs

- ▶ Evacuation/Emergency response planning
- ▶ Maritime planning
- ▶ Land-use planning



# Tsunami Land-Use Planning

- **Misuse of deterministic tsunami inundation maps for land-use decision making**
- **California Seismic Hazard Mapping Act of 1990 (for residential construction)**
  - Primarily for liquefaction and seismically induced landslide zonation
  - “Zones of Required Investigation” initiates site-specific evaluation
  - If hazard exists, mitigate
  - Real estate disclosure if in zone
- **1992 – added tsunami to CA-SHMA; produce PTHA maps when funding and ability to produce maps exists**





# PTHA – Development in CA

1980s – Prob. Seismic Hazard Analysis

1990 – Seismic Hazard Mapping Act

[2006-08 – Seaside, Oregon PTHA study]

2009 – NTHMP funding proposal for CGS

2010 – CA-PTHA – work initiated

- Developed paleotsunami/seismic deposit DB
- Coordinated with URS/Caltrans/PEER
- Held first CA-PTHA workshop with PEER on methods
- Pilot Studies developed:
  - Crescent City (low vulnerability, high hazard)
  - Huntington Beach (high vulnerability, low/moderate hazard)
- URS completes Year One modeling – Distant sources

2011 – CA-PTHA – work continued

- Developed Crescent City as pilot comparison between Thio and Gonzalez methods
- Established CA Tsunami Policy Work Group
- NTHMP finalized tsunami hazard modeling/mapping guidance and held model validation workshop
- Held second CA-PTHA workshop with PEER on Cascadia and Aleutians sources



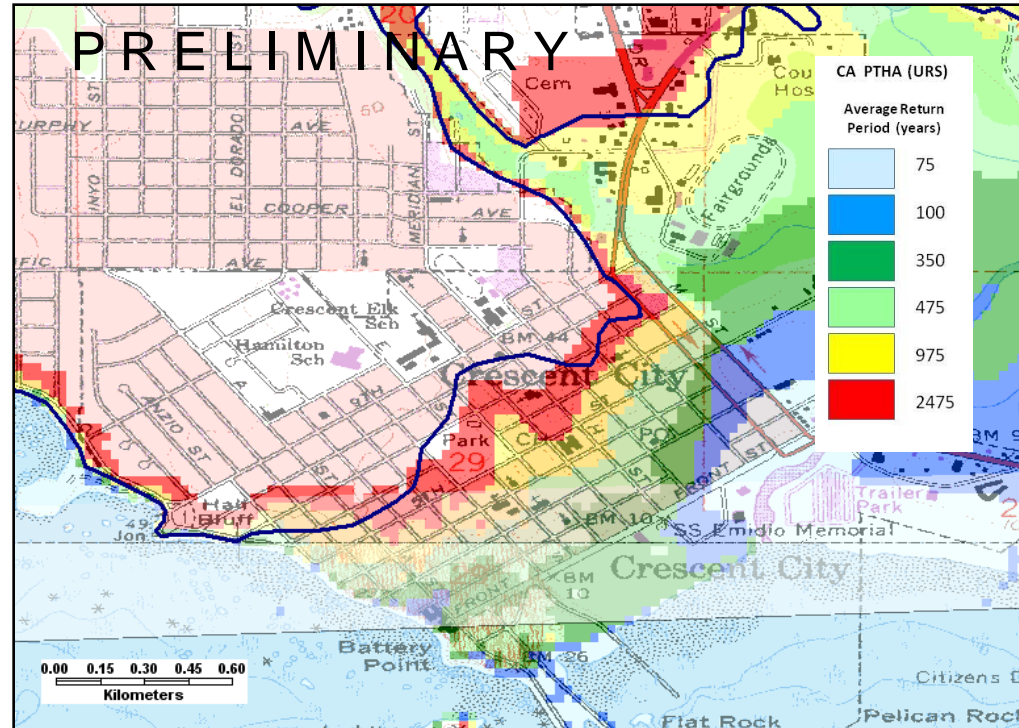
*Crescent City*



*Huntington Beach*

# PTHA Applications

- Land-use planning (CA-SHMA)
- Real estate disclosure (CA-SHMA)
- Standardized hazard analysis for evacuation planning (CalEMA)
- Building design and construction (ASCE, UBC/IBC)
- Flood insurance (FEMA, Risk MAP, CA-DWR)
- Input for consistent risk analysis and damage estimates (HAZUS)

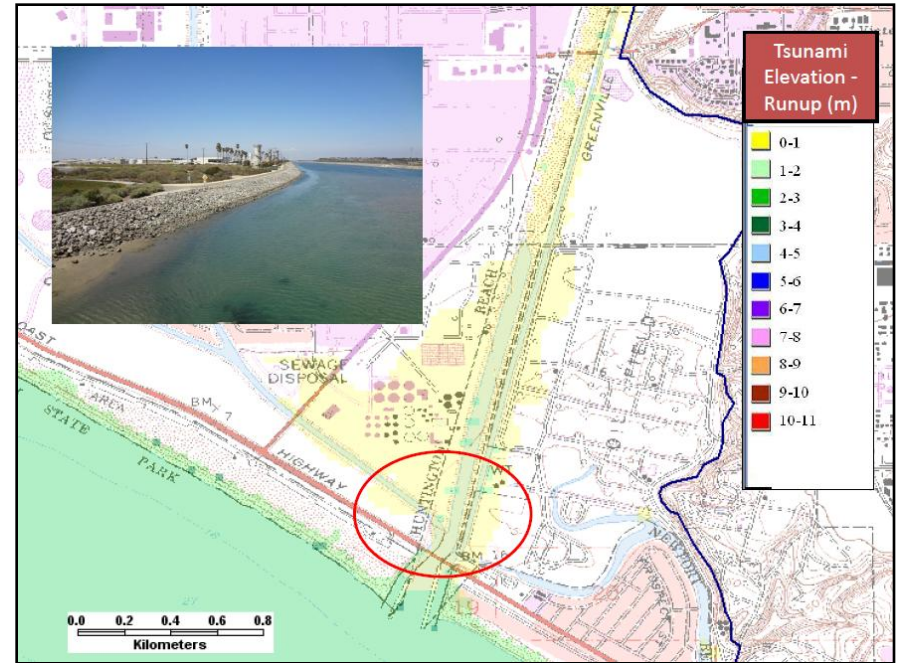


URS Consultants, 2012 for  
Caltrans//PEER

Probabilistic Tsunami Hazard  
Analysis in Crescent City; blue line  
is 2009 state inundation map line

# PTHA – On-going and Planned Work in CA

- Establishing review work group(s) for:
  - Sources
  - Map accuracy/DEMs
  - Methodology
  - Application/Policy
- Review and compare first-generation results and reports from Thio and Gonzalez
- Determine probabilistic risk levels (average return periods) based on applications
- Develop second-generation maps/products, intended to including:
  - Flow depth
  - Flow velocity
  - Inundation area
  - Modeled time series
  - Momentum flux
- Projected state-wide map completion 2013-14



*URS Consultants, 2012 for USGS Science Application for Risk Reduction Program*

*Problem with DEMs/modeling/mapping with overtopping of river levees*